DOCUMENT RESUME

ED 094 980 SE 017 370

TITLE	Environmental Education. Position Paper No. 10.
INSTITUTION	New York State Education Dept., Albany.
PUB DATE	Mar 71
NOTE	19p.
EDRS PRICE	MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS	*Educational Policy; *Educational Programs; Elementary Education; *Environmental Education; Evaluation; Policy; *Program Descriptions; Secondary Education; *State Programs
IDENTIFIERS	*New York

ABSTRACT

In this paper the Regents of the University of the State of New York present their position on environmental education in the elementary and secondary schools. The statement of position is coupled with a proposal for action by the Legislature and Governor at the 1971 Legislative Session. The environmental problem is briefly defined and the goals and objectives for environmental education in the state of New York are outlined. In order to achieve these objectives a program directed particularly at elementary and secondary students is proposed. The major thrust of this program is in the areas of preparation of instructional materials through case studies and local demonstration projects, teacher preparation, and a mobile state museum program for environmental education. Evaluation of all phases of the program is recommended to monitor its success. Appendices provide a description of the State Education Department's present environmental education efforts and a summary of the proposed budget for environmental education in the 1971-72 fiscal year. (JR)

A Position Paper...
...No. 10 of a Series

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ENVIRONMENTAL EDUCATION

A Statement of Policy
and Proposed Action
by the
REGENTS OF THE
UNIVERSITY OF THE
STATE OF NEW YORK

THE STATE EDUCATION DEPARTMENT
ALBANY
MARCH 1971

SE 017 370

THE UNIVERSITY OF THE STATE OF NEW YORK

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FOREWORD

Interest in the environment has grown remarkably. It is one of those subjects on which most of us agree. From litter to smog to fouled streams, traffic jams and overpopulation—it's clear people favor a clean environment. We want decent, livable cities, and unspoiled countryside.

Granted this, how do teachers and students approach these issues? They have always seemed beyond anyone's ability to change significantly. Only recently have schools begun to examine their responsibility in this area.

Environmental education in New York State has made rapid strides in the current school year. Few teachers and administrators remain as bystanders today. Alarm over waste, misuse and pollution of our resources has captured the imagination of students.

Schools have invested many courses with considerations of ecology. Community resources are being tapped. Adults are learning along with students, while teachers are hard pressed to keep a step ahead.

Despite wide interest, there are few courses in the public schools devoted entirely to environmental study, and few teachers with special preparation in this field. In order to overcome these deficiencies, immediate statewide action is needed.

In this paper the Regents state their position on environmental education in the elementary and secondary schools. The statement of position is coupled with a proposal for action by the Legislature and Governor at the 1971 Legislative Session. We urge support of the proposal by legislators, the Governor and all persons in the State concerned for our future environment.

Ewald B. Nyquist

EWALD B. NYQUIST
President of the University and
Commissioner of Education

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INTRODUCTION

Public concern about the environment usually takes the form of isolated reaction to specific, dramatic, incidents. It is clear that this concern must be transformed into an understanding that the several problems of the environment are closely interrelated and collectively constitute a serious challenge to our way of life and our very existence. The educational task is to cause the public to transform concern into constructive action.

Education will not solve problems of the environment in isolation, but through the educational process the way the child relates to the environment is shaped. We address ourselves to the process in this paper.

PROBLEM DEFINITION

The environmental problem can be briefly summarized as follows—man's individual and collective actions threaten to adversely affect the quality of life for present and future generations. If society is to be in a position of intervening in a positive way to prevent environmental deterioration, the public must be equipped to analyze the factors which cause the problem and take preventive and corrective action.

Generally speaking, the causes can be summarized as follows:

1. The average citizen is not properly equipped to determine the actual impact that individual or collective action in society might have on creating future environmental problems.
2. Individuals do not generally possess the technical knowledge required to understand the repercussions of any given technical innovation or individual act. They either overreact in terms of emotionalism rather than in terms of knowledge or underreact in order to protect traditional practices and vested interests.
3. Generally citizens are not aware of the different viewpoints and values of those whose economic, social and political interests cause environmental problems.
4. Citizens do not generally understand the economic, social and political actions required for society to deal with environmental problems and do not generally act to solve these problems.

Educational programs designed to attack these causes and solve the problem must overcome these constraints:

1. There is not sufficient opportunity in schools for students to apply knowledge attained to real life situations.

2. There is reluctance within schools to adapt to unusual situations by departing from the traditional curricula.
3. There is a general tendency in the schools for the teaching of knowledge rather than having students develop their own knowledge and value base.

GOAL AND OBJECTIVES

We propose the following educational goal: *That a student upon leaving the educational system has a set of values that leads him to accept his responsibility toward his natural surroundings and views the primary role of man as being a participant in rather than a master of his natural surroundings.*

The objectives of the environmental education program related to this goal can be stated as follows: To instill within students an awareness, concern and an ability to evaluate the effects of their individual and society's actions on the environment; to have students develop the capacity to examine the causes of any given environmental problem and to evaluate it in a rational manner; to make students aware of the constraints which inhibit changes in either individual or collective actions given the different viewpoints and economic interests of the business and political community; and to develop student values toward action which result ultimately in constructive change in the environment.

In order to achieve these objectives we propose the following program directed particularly at elementary and secondary students.

PROPOSED PROGRAM

The proposed program has five parts: 1) The development of instructional materials through local case studies and demonstration projects on real environmental problems in New York State; 2) The recording — filmed and written — of the actual preparation process for these cases and projects in order that others may learn about the process of examining any given environmental issue; 3) Inservice training of teachers for the use of the instructional materials developed in the case studies and demonstration projects; 4) Technical assistance to teacher preparation institutions on developing preservice training for teachers of environmental education; 5) The State Museum program. "Museum on the Move" is expanded to provide more service to local districts throughout the State in identifying the

environmental problems and their causes, and to provide technical assistance to educational institutions for action programs within the schools.

Specifically, the following activities will take place: (A summary of the proposed budget for fiscal year 1971–72 is in Appendix B of this paper.)

Environmental Case Studies and Demonstration Projects

The first step in implementing the environmental education program will involve the preparation of instructional materials through case studies and local demonstration projects (hereafter both are referred to as "projects") which cover a number of environmental problems of significance to various sections of the State. It is expected that the case studies will be most appropriate for children in grades 7–12, whereas local demonstration projects will be appropriate for all grades. Examples of possible projects follow: 1. An examination of the interstate, economic, technical and political aspects involved with the Ticonderoga Plant on Lake Champlain; 2. An examination of the power crisis which exists in New York City which would include an analysis of the various types of power production that might be used to provide more electric power and to examine the major objections from different groups of citizens concerned with the quality of the environment; 3. An examination of the noise pollution problem in various cities; 4. An examination of either the air pollution problem or the waste disposal problem in various localities; 5. An examination of pollution in the Hudson, Mohawk or other major rivers of the State or of Long Island Sound.

Other possible projects would be suggested by the local school districts interested in participating in this program. As described in Appendix A, the two publications of the Department, "Environmental Education Instructional Activities" for grades K-6 and 7–12, have numerous suggestions of activities which could be developed into projects.

An overall framework for the preparation of instructional materials will be developed and then local school districts will be invited to apply for funds to undertake projects that will produce materials for part of the framework. A part of each project will be to record the steps that each group takes in developing the project. Students and teachers would handle this recording. Students will also synthesize the case, including a study of possible solutions, after the appropriate viewpoints have been brought to bear on the particular case. The

emphasis of the program will be on the process of analyzing a problem and the various results, both positive and negative, which will result from the alternatives to be suggested. No effort will be made to show the " right " answer since few, if any of these problems have one solution.

The specific manner in which case and project materials would be developed would vary from school district to school district. One pattern might be as follows: First, students and teachers would view those case studies and materials which had been developed elsewhere. Teachers would emphasize the process to be used in examining any given environmental problem and also make the students aware of the various viewpoints that must be considered if one is to realistically assess this problem. Secondly, either the students or a combination of students, parents, teachers and the community would select an issue which they would like to examine. Once an appropriate issue has been selected, appropriate volunteer resource people from the community would be invited to assist in the project. The major part of the project would be student research and examination of alternative courses of action in terms of their practicality and possibilities for alleviating the problem.

The process will be recorded from beginning to end and, therefore, funds will also be necessary for duplicating materials and films in a fairly large number in order that they might be sufficiently utilized in other schools. The materials and films will be used in building statewide instructional materials and guides in teacher training, and for use by students who develop their own projects within their communities. Since integration of these case studies and local projects into the total curriculum is imperative, each school when applying for funds, will be required to indicate plans showing how this integration will be accomplished. Ten to twenty projects will be funded in 1971–72.

Teacher Preparation

The development of case studies and demonstration projects will begin in April 1971 and proceed through the summer into the next academic year. Inservice teacher preparation will be under way during the same period, but in different phases. Part of this training can begin in April and proceed on the basis of materials and guidelines which will be ready at that time. The training will be closely related to the local projects which are to be funded. During the period April through June, a statewide network system for inservice teacher train-

ing will be developed. During the summer, special training will be provided for the key trainers in the inservice training network so that they may have the network in full operation during the academic year 1971–72. Some materials from the projects started in the spring of 1971, and the summer, will be available for the inservice training network. More materials will be developed during that fall semester so that the complete battery of materials prepared through the case studies and projects will be ready for widespread dissemination and wider use in teacher training during the spring of 1972.

In addition to the above inservice preparation, it is necessary to provide assistance to teacher preparation institutions, both public and private, in establishing or strengthening their preservice training programs for environmental education. We propose to provide such assistance through consultant arrangements closely allied to the work in local districts on projects and case studies and to the inservice training program outlined above. The local projects and case studies will provide a prime resource for learning about the types of preservice training that are necessary to equip teachers for handling environmental education. Through case studies and networks of inservice training, we will gain experience which can be used to assist colleges and universities in organizing interdisciplinary activities specifically directed at environmental education.

The teacher training institutions will be able to use the project materials in their programs. Preservice training programs would be designed to have trainees work in the local projects and case studies and to work with the inservice trainees.

State Museum Program for Environmental Education

The State Museum has had continuing success with its local summer program "Museum on the Move" which brings nature study to city parks, neighborhood playgrounds and summer camps by exhibition vehicle.

The information and experience learned from this activity indicates that a similar program focused on environmental concerns be developed and staffed for statewide supplementation of local educational programs. This would be accomplished by purchasing or leasing four vans or tractor-trailers each of which would be equipped with identical collapsible multi-media exhibits which would be driven from school to school on a regular schedule. Exhibits would be available for several days and free-time visitation would be encouraged on the part

of students and adults. The teaching member of the team would provide scheduled instruction to various groups in a temporary environmental classroom.

The program would be devoted to the ecological facts and social "trade-offs" involved in environmental modifications. Objective analysis of all types of environmental changes would be presented, using New York State examples as much as possible. A special attempt would be made to involve the students in the sensory aspects of pollution and ecology. The trucks would be on tour for 34 weeks assigned to school tours and 10 weeks to summer trips in State Parks in cooperation with the Conservation Education group of the Department of Environmental Conservation and to city parks and cooperating local museums.

The program will be integrated with local cultural resources such as museums, libraries, and other organizations through the development of complementary exhibits and programs to reinforce the visit of the "Museum on the Move" and continue its impact after it has moved to a new location.

The Museum's experience has also shown the need for scientist guidance in the development of outdoor learning laboratories, school nature preserves, nature trails, and specific action programs to improve and preserve the environment. Of the more than 4,000 public schools of the State, most urban or rural schools are immediately adjacent to or near outdoor areas suited for teaching conservation and related environmental sciences and yet only 25 percent of these have developed their own open-air teaching grounds. There is, moreover, a great lack of trained personnel to advise on suitability, development and programming. We propose the following program, to continue for at least two school years, in which museum trained and other ecologists would work on a regional basis with schools throughout the State.

Each of the school districts would be investigated ecologically and plans would be prepared for administrators in terms of local conditions, listing available assets and suggested development programs. These would be related to and contrasted with other areas in the State with which the students may not be as familiar. A general guide for such activities would be prepared including lists of available references, required facilities of other governmental agencies and private organizations and recommendations for other compatible uses of the property. Such plans would be coordinated with activities and plans of the Department of Environmental Conservation.

In summary, environmental educational activities which utilize the resources of the State Museum and the expertise of environmental scientists on the Museum staff would be developed on a Statewide basis as an adjunct to elementary, secondary and continuing education programs.

EVALUATION

In order to monitor both the implementation of these programs and to evaluate their success, we are requesting that the following efforts be undertaken:

Environmental Studies

1. Pre- and post-tests will be given to those individuals involved in preparing the instructional materials to determine their attitudes, values and knowledge both before and after their involvement in this project.
2. Using these same pre- and post-tests, a determination will be made as to whether the students in fact understand the thought process and steps one must go through in analyzing an environmental problem.
3. A determination will be made as to how the statewide instructional materials method is in fact implemented during a given school year.

Local Projects

For those projects which will be funded the same items mentioned for statewide cases will be applicable. In addition, a determination will be made as to how a local program is in fact designed and implemented, and how it uses statewide instructional materials. An analysis will be made as to whether direct involvement in the case materials causes a greater change in values, attitudes and knowledge than do different types of local projects.

Inservice Training Programs

1. Teachers will be given pre- and post-tests before and after their inservice training.
2. Tests to measure attitudes will be administered both before and after a given semester of teaching.

Museum Programs

Attitude evaluation will also be incorporated into museum programs. A strong effort will be made to determine if there is the desired follow through after the museum program has left.

CONCLUSION

We have always been concerned about our environment. The concern has traditionally centered on problems of overcoming natural obstacles to provide the necessities for survival, but the focus has shifted. We have invented the technology to overcome most natural obstacles and in the process we have so changed environmental patterns that we have endangered our own existence as well as that of other living objects.

Our challenge now is to control our own actions so that we live as a part of an overall natural environment. The program proposed here will succeed only if we change our values in such a way that we view man's role as a *participant* in rather than a master of his natural surrounding. The environmental education program will be a success only if this change of values influences practical decision making in both private and public sectors toward prevention of environmental deterioration.

APPENDIX A

DESCRIPTION OF THE EDUCATION DEPARTMENT'S PRESENT ENVIRONMENTAL EDUCATION EFFORTS

Present Program

The State Education Department has already undertaken these activities: examined the role of health, science and social studies in environmental education; released two publications entitled "Environmental Education Instructional Activities" for grades K-6 and grades 7–12; supported the National Environmental Teach-in; conducted a colloquium on environmental education; launched teacher training; developed Geological and Natural History Surveys; conducted surveys of the educational and research resources of the State's colleges and universities in ecology, environmental law and environmental programs in colleges of engineering, management and architecture; organized a Conference on Engineering Education and Environmental Problems; and is distributing a 28-part television series on ecology and developing a new television series with the United Nations.

Many elements of the environmental education program are already found in the various programs in the health, science and social studies areas. In the health education area, for instance, a new publication entitled "Suggested Guidelines for the Development of Courses of Study in Health Education for Junior and Senior High Schools" includes a major component dealing with the topic *Environmental and Community Health.* The emphasis of this component is placed on the development of positive attitudes by students toward public health. The major objective of this curriculum is to have each student learn, understand and appreciate the necessity for man to conserve and utilize human resources effectively. Subcomponents deal with such topics as water pollution, air pollution, radiation, pesticides and insecticides, rodent control, sewage treatment and disposal and the

role of public health agencies and with human ecology, epidemiology and health. The subcomponent on human ecology, epidemiology and health deals with a wide range of topics in the areas of environmental education. As an example, this material includes definitions and meanings of epidemiology and ecology, deals with man's health and his physical environment, man's health and the biological environment, and man's health and the social cultural environment.

The New York State science curriculum also has sections dealing with ecology, environment and conservation. Topics such as the value of topsoil, depletion of resources, interdependence of organisms, food chains and nonrenewable sources, etc. are all part of the department's broad environmental education program.

A new social studies curriculum lays heavy emphasis on offering pupils the opportunity to analyze social phenomena and societal problems and to suggest possible steps that might be taken to solve such problems. For example, the economic concepts of alternative costs and scarcity as they relate to air pollution are addressed. In addition, the political dynamics of our system of government as they relate to the environmental problems are addressed in many parts of the curriculum. In another curriculum area the relationship of rules and laws to the environmental problem are considered. The problems associated with population growth are also included.

These examples of curriculum development are a sample of the many efforts of the Department in this area.

In addition to these efforts, many individual school districts have launched various types of innovative programs dealing with environmental education. For example, specific workshops in environmental education have been conducted, outdoor education projects have been experimented with and some schools have become involved with a particular environmental problem.

A review of these efforts by a departmental task force on environmental education whose members represented all of the interested units in the Department resulted in the development of instructional activities which have recently been published in two publications entitled " Environmental Education Instructional Activities " grades K–6 and 7–12. The task force in developing these publications felt that there was a need for an interdisciplinary approach which made broad use of both the school and the total educational community including the outdoors. They also felt that in the formative elementary years children should be exposed to a variety of experiences that will contribute to their understanding of the environment and appreciation of beauty. At the secondary level students should become

involved with community problems and those factors that affect the environment. Lastly, there is a need for continuing education so that citizens remain informed and aware of current environmental problems and develop the desire and ability to solve such problems.

The activities included in these two publications are not intended to have a subject matter orientation. The object is that any teacher concerned about the environment will feel prompted to make use of these activities in his classroom. It is hoped that this approach will stimulate all teachers in all fields to develop instructional activities addressing the major topics covered in these guidelines.

The concepts specified in these two publications are the following: survival; interdependence; scarcity; recyclement; right vs. responsibility; planning; valuing; social forces; and optimism.

Although the specific instructional activities vary in the two publications the subconcepts included under each of the concepts outlined above are constant between the two publications. The following outlines the subconcepts for each of the major concepts.

Survival

- Survival of an organism depends upon its ability to adjust to its environment. Each kind of organism represents a collection of adaptations which fit it for survival under a given set of conditions.
- The basic function of any ecosystem is to capture and transfer energy.
- Diversity is a key factor in the survival of an ecosystem.
- Physical well-being is a fundamental necessity for survival even though man often places a higher value on other things.
- Man changes the natural environment to the extent that many species find it difficult to adapt to the new conditions.

Interdependence

- Living things are interdependent with one another and with their environment.
- Natural resources are unequally distributed with respect to land areas and political boundaries, and the use or misuse of them affects others.
- The energy requirements of man are met primarily by "food", and men are dependent upon other organisms through food chains and food webs.

Scarcity

- An understanding of scarcity is necessary to our understanding of the environment.
- Some parts of the natural environment are either difficult to replace, or are in fact irreplaceable.

Recyclement

- In nature, there is a continuous recycling of many elements.
- Man would do well to observe nature's example and recycle the results of his technology.

Right vs. Responsibility

- Man has exercised a presumed right to exploit the environment with little regard for his responsibility to preserve it.
- It is the responsibility of each individual to become aware of existing governmental regulations intended to protect the environment.

Planning

- Decisions concerning the future must be based on long term environmental benefits.
- Man alters the options available to future generations when he unwisely manipulates the natural environment.

Valuing

- Man currently faces the prospect of endangering his chances of a better life through the very measures he employs to achieve it.
- Individuals tend to select short-term economic gains, often at the expense of greater long-term environmental benefits.

Social Forces

- In order to preserve our threatened environment, present attitudes must change to reflect a widespread public concern which will encourage protective action by individuals, groups, and government.

The emphasis of these two publications is that man must be the steward of his environment. The activities place heavy emphasis on the behavior and attitudes that one should have if one is to be a responsible citizen of the future.

The following guidelines have been developed for environmental education:

(1) For an effective program in environmental education, one must consider the total school setting—the structure of school buildings, relations of pupils and teachers, courses of study, outside school building activities.

(2) A curriculum in environmental education should be multidisciplinary in nature. Obviously, the natural sciences have a major responsibility but even in these areas the emphasis should be on social process and not merely investigative process. The social sciences have a special responsibility to examine present social values as well as the economic, political and social aspects of environmental problems. The humanities also have a significant responsibility in environmental education.

(3) A curriculum should be more than merely courses of study or classroom activities. It should give pupils outdoor opportunities to live and work in natural environments.

(4) The curriculum should be sequential from prekindergarten through adulthood.

(5) In planning new school buildings, consideration should be given to constructing them in harmony with the natural environment and building natural environment into them.

(6) For a program to be successful, teachers must be helped through inservice programs which would include environmental experiences.

(7) Environmental problems should be studied in totality as complex phenomena in our industrial society—there are no simple solutions. Environmental education must raise basic questions of the tenets of industrial society, technology and economic growth.

APPENDIX B

Summary of Proposed State Budget

For

Environmental Education

Fiscal Year 1971–72

	Fiscal Year 1971–72
1. Environmental Studies and Local Demonstration Projects	$ 600,000
2. Teacher Preparation, Including Technical Assistance to Teacher Training Institutions	400,000
3. State Museum Program	300,000
4. Evaluation	100,000
5. Administration	100,000
TOTAL	$1,500,000

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